

- d. a frequency shifter for shifting the frequency of said modulating frequency,
- e. a plurality of acousto-optic modulators for modulating the intensities of said respective plurality of beams,
- f. a plurality of crossed polarizers for polarizing said respective plurality of beams,
- g. a directional coupler for reflecting one of said beams to provide a reflected beam and redirecting said reflected beam,
- h. a beam scanner for causing one of said beams to scan across said area,
- i. an optical processor for processing the combined energies of said plurality of beams, and providing a data output,
- j. an electronic processor for processing said data output from said optical processor to provide processed data, and
- k. a data processor for processing said processed data from said electronic processor,
- l. said data processor containing a pattern recognition algorithm and previously stored data and arranged to compare said previously-stored data with said processed data from said electronic processor,
- m. said pattern recognition algorithm also arranged to provide an indication of the identity of said pattern based on its comparison of said previously-stored data with said processed data from said electronic processor.

²
~~22~~. The system of claim ¹~~21~~ wherein said light source is a light-emitting diode.

³
~~23~~. The system of claim ¹~~21~~ wherein said light source is a bandpass-filtered, incandescent lamp.

⁴
~~24~~. The system of claim ¹~~21~~ wherein said modulating frequency source is arranged to modulate a first of said acousto-optic modulators at a first frequency.

⁵
~~25.~~ The system of claim ~~21~~¹ wherein said modulating frequency shifter is arranged to shift the frequency from said modulating frequency source and apply said shifted frequency to a second of said acousto-optic modulators.

⁶
~~26.~~ (New) The system of claim ~~21~~¹ wherein a first of said crossed polarizers is arranged to polarize light from the first of said acousto-optic modulators, and a second of said crossed polarizers is arranged to polarize light from the second of said acousto-optic modulators, the angles of polarization of said first and second polarizers being separated by ninety degrees.

⁷
~~27.~~ (New) The system of claim ~~21~~¹ wherein said first crossed polarizer is positioned to cause light from itself to enter said beam scanner.

⁸
~~28.~~ The system of claim ~~21~~¹ wherein said directional coupler is positioned to cause light from itself to enter said beam scanner.

⁹
~~29.~~ (New) The system of claim ~~21~~¹ wherein said second crossed polarizer is positioned to cause light from itself to enter said optical processor.

¹⁰
~~30.~~ The system of claim ~~21~~¹ wherein said optical processor is arranged to combine said first and second beams of light into a combined beam and detect the characteristics of said combined beam.

¹¹
~~31.~~ The system of claim ~~21~~¹ wherein said electronic processor is arranged to further refine the signal from said optical processor into amplitude and positional information.

12

~~32.~~ The system of claim ~~21~~ wherein said data processor is arranged to utilize said analog and positional information from said electronic processor to produce a binary value of said signal corresponding to said positional information.

13

~~33.~~ (New) The system of claim ~~21~~ wherein said data processor is arranged to provide data to said pattern recognition algorithm and said pattern recognition algorithm is arranged to compare said data with said previously stored data for identifying an individual.

14

~~34.~~ The system of claim ~~21~~ wherein said area is a fingernail of an individual, whereby said system can recognize the identity of said individual.

35. (New) A method for determining the identity of a pattern within an area, comprising:
- a. scanning said area with a scanning beam of light from a source other than a laser, having a predetermined spectral bandwidth to provide a reflected beam,
 - b. providing a reference beam of light having a predetermined bandwidth,
 - c. providing an analysis system containing previously stored pattern recognition data,
 - d. analyzing the sum of light in said reflected beam and light in said reference beam to provide an analysis,
 - e. providing said analysis to a pattern recognition algorithm,
 - f. using said algorithm to compare the results of said analysis with said previously stored pattern recognition data, so as to provide a comparison, and
 - g. using said comparison to identify said pattern.

36. The method of claim 35 wherein said area is a fingernail of an individual, whereby said method can recognize the identity of said individual.

37. The method of claim 35 wherein said area is a toenail of an individual, whereby said method can recognize the identity of said individual.

38. The method of claim 35 wherein said comparison provides a positive or negative identification of said pattern.

39. The method of claim 35 wherein said comparison provides an identification of said pattern along with a confidence level.

40. (New) A system for determining the identity of an individual, comprising:

- a. means for scanning a beam of polarized light within the nail bed of an individual to provide a reflected beam,
- b. means for analyzing said reflected beam to provide an analysis,
- c. means, containing previously stored data, for comparing of the results of said analysis with said previously stored data to provide a comparison, and
- d. means for providing a positive or negative identification of said individual based upon said comparison.

REMARKS--General

Applicants have amended the claims of this application to place it in full condition for allowance. The following table shows the present claims and their antecedents.

B